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Factors Associated With Care Seeking From Physicians, Physical Therapists, or Chiropractors by Persons With Spinal Pain: A Population-Based Study

Low back pain (LBP) and neck pain (NP) account for as much as a third of all visits to outpatient physical therapy practices.^{34,35} Despite providing this apparently high proportion of care, physical therapists rank third behind physicians and chiropractors in patient care-seeking rates among the major clinician types who provide care for patients with LBP,^{7,8} with the majority of persons seeking care for LBP from a physician.^{7,21,28} Deyo and Tsui Wu²¹ found that 59% of all persons with LBP seek care from



a physician. In ambulatory care medical settings, LBP ranks fifth among all diagnoses as a reason for a physician visit and second among symptomatic complaints for a physician visit, accounting for 2.3% to 2.8% of all visits to physicians.^{20,28} After physicians, chiropractors are the next major provider group, accounting for a substantial proportion of care.^{7,8,21} In chiropractic, 40% to 68% of all patients report LBP as the primary reason for seeking care and NP as the second most common reason.^{17,30,40}

Among these 3 major types of care providers for LBP and NP, physicians and chiropractors are similar because both provide primary care, while physical therapists and chiropractors are similar because both provide manipulative and corrective care. The conceptual and philosophical basis of care for physical therapists and chiropractors does differ, and 2 older studies conducted in the UK and Sweden indicate that chiropractors use more manipulation and physical therapists provide both manipulation and mobilization, as well as exercise, modality-based treatment, and education.^{36,43}

Variation in the attributes that determine care seeking for LBP has been docu-

- **STUDY DESIGN:** Secondary analysis of longitudinal population-based survey data.
- **OBJECTIVES:** To investigate factors associated with care seeking for physician-referred physical therapy (MD/PT), as compared to physician-only (MD) or chiropractic-only (DC) care for spinal pain.
- **BACKGROUND:** Although a large proportion of ambulatory physical therapy visits are related to spinal pain, physical therapists are not the most commonly seen provider. The majority of visits are to physicians, followed by chiropractors. We attempted to understand more about this disparity by examining social and demographic factors that differentiate between persons who see these providers.
- **METHODS:** Episodes of care were constructed from participants in 2 panels from the Medical Expenditure Panel Survey who had spinal pain. The provider of care was identified for each episode, and logistic regression was used to determine factors associated with MD/PT use compared to MD

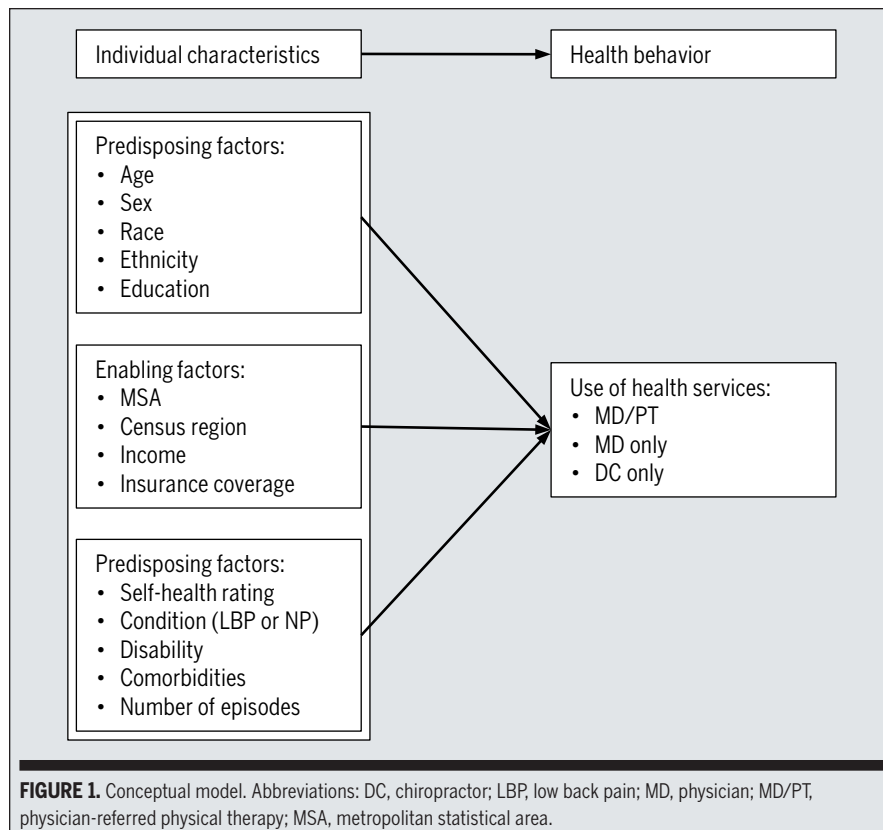
use, and MD/PT use compared to DC use.

- **RESULTS:** The majority of patients (61%) received MD care for spinal pain, followed by those who received DC (28%) and MD/PT (11%) care. Female sex, higher levels of education, and higher income were significantly associated with MD/PT care over MD care. Increased age, female sex, lower self-health rating, and presence of at least 1 disability day were all significantly associated with MD/PT care over DC care.

- **CONCLUSION:** Sociodemographic and clinical factors are associated with those who get MD/PT care as compared to MD or DC care. We found evidence of an access disparity for physical therapy and identified population characteristics that both increase and reduce the likelihood of physical therapy service use. *J Orthop Sports Phys Ther* 2011;41(7):467-476, Epub 7 June 2011. doi:10.2519/jospt.2011.3637

- **KEY WORDS:** health services utilization, low back pain, neck pain, treatment

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and chiropractors, the 3 major groups of providers. Studies that examine variables associated with care seeking among patients cared for by different provider types could assist in developing strategies to optimize care for these patients. Knowing how the characteristics of patients seen by the major providers differ on a national scale would enable predictions of future ambulatory care needs for LBP and NP, and of manpower needs among the professions. For the profession of physical therapy, this type of analysis may lead to a discussion of how to best target initiatives designed to increase access for those who are appropriate for physical therapy care.⁴

The primary purpose of this study was to determine the patient characteristics associated with those who receive physician-referred physical therapy (MD/PT) for LBP or NP, as contrasted to those who receive physician care exclusively (MD) or chiropractic care exclusively (DC). A secondary purpose was to examine the proportion of persons with spinal pain who actually sought out care for their condition. We hypothesized that there would be demographic, economic, and health-related differences among patients seen by the major provider types.

METHODS

Data Source

THIS ANALYSIS IS BASED ON DATA from 2 panels of respondents to the Medical Expenditure Panel Survey (MEPS) Household Component. Data for these panels were collected from January 2001 to December 2003. The MEPS is a survey designed to provide population estimates of health services utilization and expenditures for the noninstitutionalized, civilian population of the United States. Participants in the MEPS provide data on demographics, medical conditions, use and cost of health services, insurance coverage, and health status.¹⁴ The MEPS incorporates an overlapping-panel design, in which persons on an enrolled panel participate in a comput-

mented, but the reasons for this variation are unclear.^{7,8,16,23} Care seeking for physical therapy, as a predominantly isolated service, has been documented in 2 studies.^{25,37} Physical therapy is described as a predominantly isolated service, because the great majority of patients receiving physical therapy for spinal pain are referred for physical therapy by a physician. Mielenz et al³⁷ found that, in addition to clinical variables, having at least a postsecondary level of education and receiving worker's compensation were related to physical therapy care seeking among persons with acute LBP. The clinical variables that predicted care seeking were symptoms in the lower extremity and higher levels of disability. Freburger et al²⁵ analyzed a sample of patients with both LBP and NP who visited specialty spine centers, and supported the contention that care seeking for physical therapy was associated with clinical variables. More striking, however, was the finding related to nonclinical variables associated

with care seeking, which indicated that physical therapists were seeing patients of higher socioeconomic status.

Studies that compare the attributes of patients who seek care from different providers (physical therapists, physicians, or chiropractors) are limited. Most studies that incorporate any type of comparison involving physical therapists, physicians, and chiropractors are clinical studies that compare the outcomes of interventions.^{10,32,33,42,43} The few studies that have examined the characteristics of persons seeking out providers of care for spine-related pain are limited to comparisons of users of physician and chiropractor care.^{16,31,39} These studies indicate that persons seeking care from chiropractors have less comorbidity and fewer disabling conditions than those who seek care from physicians.

We found no nationally representative studies that compare the attributes of persons with LBP or NP who receive care from physical therapists, physicians,

er-assisted personal interview for data collection during 5 rounds of interviews over a 2-year period. In a study that explored the factors associated with physical therapy care received among persons with musculoskeletal conditions, Carter and Rizzo⁹ used MEPS data and provided a description of the benefits of drawing from this data source.

On an annual basis, the Agency for Healthcare Research and Quality (AHRQ) recruits a new MEPS panel of participants. Each MEPS panel is drawn from a sample from respondents to the previous year's National Health Interview Survey (NHIS). The NHIS sample, which reflects the MEPS sample, is designed to be nationally representative, with oversampling of the Hispanic and Black populations. Details about the MEPS sampling process, data collection, and survey questions may also be found on the dedicated website of the AHRQ MEPS.² At the time this study was undertaken, we analyzed data from the most recently available panels (6 and 7). Panel 6 participants were surveyed from 2001 to 2002, and panel 7 participants from 2002 to 2003.

In addition to the MEPS Household Component, a MEPS Medical Provider Component serves as a supplement to, and source of validation of, the expenditure and utilization data collected. The medical provider sample incorporates data from hospitals, pharmacies, and home healthcare providers that were reported by participants in the MEPS Household Component. Data from the MEPS Medical Provider Component are integrated into the publicly available datasets used for this study.

Conceptual Framework

The Andersen "behavioral model" is widely used as a framework for studies of healthcare use and access to care.^{5,38} This model has been used in physical therapy to define the antecedents of utilization for persons with LBP²⁵ and other musculoskeletal conditions.⁹ In the Andersen model, predisposing, enabling, and need factors are the constructs that explain

TABLE 1		
FOUR-DIGIT ICD-9-CM DIAGNOSTIC CODES USED TO DEFINE LOW BACK PAIN AND NECK PAIN		
Three-Digit Heading	Low Back Pain	Neck Pain
353. Nerve root and plexus disorders	353.4	353.2
720. Ankylosing spondylitis and other inflammatory spondylopathies	720.0, 720.1, 720.2	
721. Spondylosis and allied disorders	721.3, 721.4	721.0, 721.1
722. Intervertebral disc disorders	722.1, 722.2, 722.3, 722.5, 722.6, 722.7, 722.9	722.0, 722.4
723. Other disorders of the cervical region		723.0-723.9
724. Other and unspecified disorders of back	724.0, 724.2, 724.3, 724.4, 724.5, 724.6, 724.7, 724.8, 724.9	
739. Nonallographic lesions, not elsewhere classified	739.9, 739.4	739.1
846. Sprains and strains of sacroiliac region	846.0-846.9	
847. Sprains and strains of other and unspecified parts of back	847.2, 847.3, 847.4, 847.9	847.0
953. Injury to nerve roots and spinal plexus	953.2	953.0

use of health services at the individual or patient level (**FIGURE 1**). Predisposing factors include demographic variables, enabling factors include income and insurance variables, and need factors are related to variables that define individual health issues, including comorbidities and health status. These factors are the major influences on an individual's propensity for care use and, when examined at the aggregate level, help to differentiate disparities in access to care. The majority of utilization studies using the Andersen model do not differentiate the type of care provider, as utilization studies typically examine the service as an end point.³⁸ Choice of provider as the outcome has been analyzed in individuals with mental impairments using the Andersen model.²⁷ In our study, we modeled use of a physical therapist as opposed to a physician, and use of a physical therapist as opposed to a chiropractor, for LBP or NP. The independent variables selected were based on the Andersen model, the data available in the MEPS databases, and prior studies on care seeking and use of care for LBP and NP.

Identification of Cases

The variables that identified if a person had LBP or NP were extracted from the

MEPS condition data files, which contain responses to the questions about all physical and mental conditions experienced in the 2 years of participation. At each of the 5 MEPS interviews, participants were asked to list all of their "conditions, accidents, or injuries, regardless of whether they saw a medical provider, received treatment, or took medications, and to include health problems that may have been mentioned during a previous interview." Health problems were defined as "physical conditions, accidents or injuries that affect any part of the body, as well as mental or emotional health conditions such as feeling sad, blue or anxious about something."³⁸ Information obtained during interviews was recorded verbatim. Professional coders employed by AHRQ used the verbatim details provided by the participant to map conditions to the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) diagnostic codes. For the purpose of our study, a participant was defined as having LBP or NP according to ICD-9-CM codes. Because the MEPS public use files are limited to major categories (3-digit codes), we were granted permission to use the AHRQ Center for Financing, Access, and Cost Trends data center to gain access to the 4-digit ICD-9-

CM codes that allowed us to distinguish between persons with LBP or NP. **TABLE 1** provides a list of the 4-digit ICD-9-CM codes used to define LBP and NP in this study. These ICD-9-CM codes were used to identify LBP and NP that derived primarily from mechanical causes.

We identified cases with LBP or NP by examining responses to the question that asked respondents to list their condition and by the ICD-9-CM codes in each of the 5 rounds of interviews. Once a case was identified, we used participant characteristics data files to match demographic variables and information derived from the interview in which the condition was identified, to ascertain if there was a disability day, comorbidity present, and health status. The participant's condition provided a unique identifier that enabled us to track all visits associated with that condition until the MEPS interviews ended.

Potential Explanatory Variables

Demographic variables representing both predisposing and enabling factors, including age, sex, race, ethnicity, educational attainment, metropolitan statistical area, census region, and insurance coverage, were extracted directly from the MEPS person-level data files. The income variable was derived from a categorical variable on the MEPS dataset that describes family income in terms of poverty status, controlling for size of family and age of earners. Accordingly, low income is defined as income less than 200% of the poverty level, middle income as 200% to 399% of the poverty level, and high income as at least 400% of the poverty level. For demographic variables that might have changed during the 2 years of empanelment (eg, age, marital status), the variables used were those recorded on December 31 of the first year of the panel.

Additional variables related to the conditions of LBP and NP that represented need factors, including whether the condition was associated with at least 1 disability day, the number of comorbid conditions, and a self-rating of health

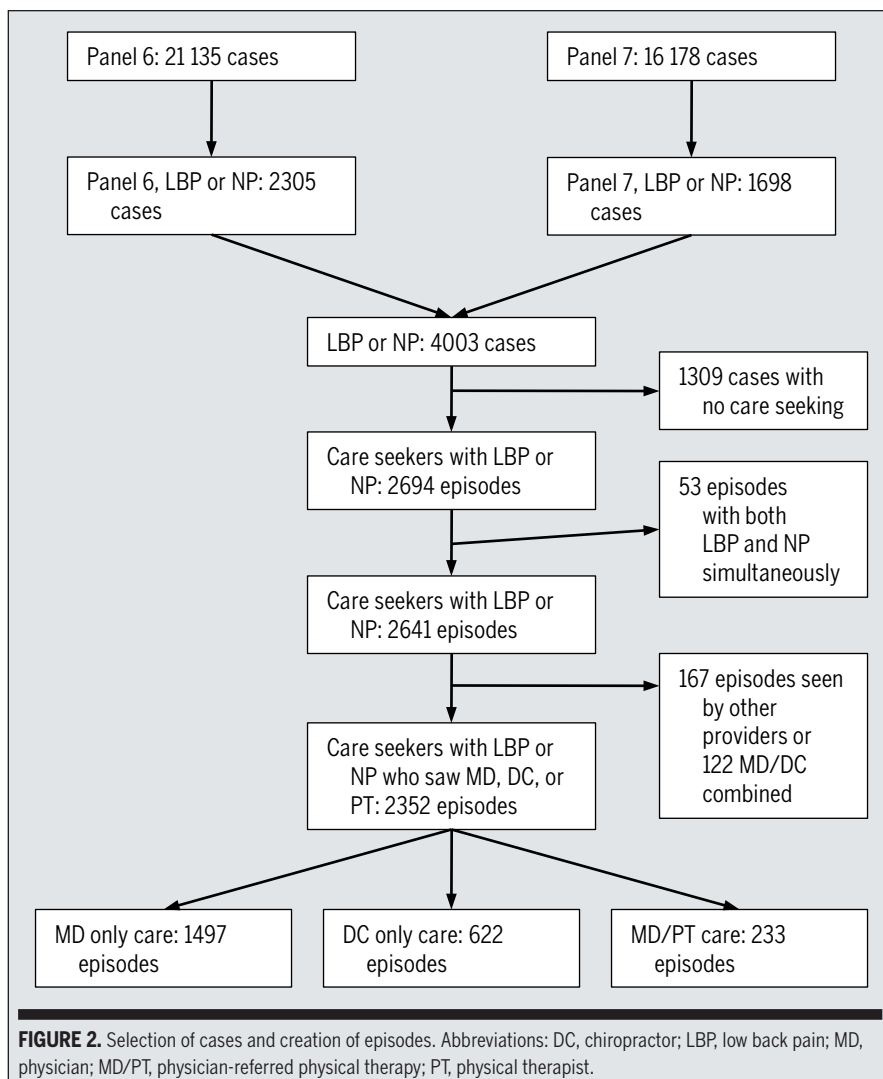


FIGURE 2. Selection of cases and creation of episodes. Abbreviations: DC, chiropractor; LBP, low back pain; MD, physician; MD/PT, physician-referred physical therapy; PT, physical therapist.

status, were extracted from the condition data file during the case identification process. Having associated disability day(s) was defined as a positive response for any of the variables indicating that a person had missed work, missed school, or spent a day in bed as a result of the LBP or NP condition. The number of comorbid conditions was obtained by counting conditions, listed in addition to that of LBP or NP, for each person on the MEPS conditions data file. The count of comorbidities was based on those listed in the interview round when LBP or NP were identified.

Data were analyzed at the level of an episode of LBP- or NP-related care. Episodes were defined for all persons identified as having LBP or NP, in a manner

similar to that of Shekelle et al.⁴¹ An episode included all LBP- or NP-related health practitioner visits that occurred sequentially with no more than 3 months between visits. In this study, if a person had multiple episodes of care over the 2 years of the survey, the final episode of care was the one analyzed.

Subjects

In total, there were 21 135 panel 6 and 16 178 panel 7 cases in the final data file. From the 2 panels, 4003 cases with LBP or NP were identified, from which 2694 were selected for an occurrence of care seeking. This resulted in 2208 cases with LBP and 433 with NP, 53 of which we eliminated from the analysis for hav-

TABLE 2

PERCENTAGE OF PERSONS RECEIVING CARE FOR EACH CONDITION BY PROVIDER TYPE STUDIED*

Group	All Spinal Pain (n = 2352)	LBP (n = 1962)	NP (n = 390)
MD (n = 1497)	61.0 (58.4, 63.7)	61.9 (58.9, 64.9)	56.6 (50.9, 62.3)
DC (n = 622)	27.8 (25.3, 30.4)	27.5 (24.8, 30.3)	29.2 (23.7, 34.8)
MD/PT (n = 233)	11.1 (9.6, 12.6)	10.5 (8.9, 12.1)	14.1 (10.1, 18.2) [†]

Abbreviations: DC, chiropractor; LBP, low back pain; MD, physician; MD/PT, physician-referred physical therapy; NP, neck pain.

*Values are percentages (95% confidence intervals). Percentages in columns do not sum to 100 due to rounding error.

[†]Low reliability estimate based on less than 100 sample records, relative standard error does not exceed 30.

ing both LBP and NP simultaneously. These cases were eliminated because AHRQ staff guidelines for obtaining reliable estimates from the MEPS indicate that a minimum 100 cases and a relative standard error of less than 30% for any estimate are required to produce stable estimates. We also eliminated cases in which there were episodes of care provided by practitioners other than physicians, chiropractors, or physical therapists (n = 167), and those in which there were episodes of care provided by both a chiropractor and physician (n = 122). **FIGURE 2** shows how cases became episodes of care and the elimination of cases and episodes to create the final analysis file. The analysis file used in this study contained 2352 episodes of care provided by the 3 providers of interest. Those episodes classified as incorporating physical therapy care (n = 233) were termed MD/PT to clarify that these were physician-referred physical therapy episodes of care. Of these episodes, only 30 did not have a physician visit identified, which might have represented data censoring of physician visits that preceded the start of MEPS data collection.

Data Analysis

The unit of analysis for this study was the episode of care for spinal pain, which was termed as either LBP or NP. Rather than differentiate between provider-based care seeking by condition, we chose to include LBP and NP as independent variables in the analysis, partly due to

sample size. All data were analyzed using the Stata/SE 10.1 for Windows (Stata-Corp, College Station, TX). Stata survey commands were used to account for the complex survey design, employing variables for weighting, primary sampling unit (PSU), and stratum.

Hosmer and Lemeshow²⁹ have identified the limitations and approaches that are needed in model building and analysis of complex survey data. Because the additional tests and diagnostics used in logistic regression model building are not available in the Stata complex survey package, both a “model-based” analysis and a “design-based” analysis were conducted. In the model-based analysis, the complex survey variables were not used, so that logistic regression diagnostic statistics could be calculated to assess the model assumptions and model fit. Changes incorporated in the regression from the model-based analysis were then carried into the design-based analysis to produce the actual estimates used in the presentation of multivariable regression results and tables.

The model-building strategy and model-based analysis used was completed by first conducting an analysis of each variable in the model, using a contingency table and the likelihood ratio chi-square test statistic for nominal variables and logistic regression for continuous variables. Multivariable models for each provider comparison were analyzed for a full model with all the study variables and for partial models in which variables with

a *P* value less than .25 and those deemed clinically relevant were included.²⁹ The relative importance of variables in the multivariable model was confirmed by examination of the Wald statistic. Subsequent models with and without each variable were compared to the first full multivariable model using the likelihood ratio test. To determine if continuous covariates were linear in the logit, the Stata fractional polynomial regression package was used. To examine for multicollinearity, the collinearity diagnostics (“collin”) package, available through the Stata “findit” command, was used. Model assessment included an examination of casewise diagnostics to identify variables or covariate patterns with poor fit and to identify significant interactions among the independent variables in the model. Results of this model-based analysis were then implemented into the final design-based analysis that employed the complex survey variables and produced appropriate coefficient, standard error, and odds ratio estimates. There were 2 separate logistic regression models developed to compare the MD/PT and MD groups, and the MD/PT and DC groups. The dependent variable was the provider option. A multivariable analysis with panel as an independent variable was also conducted to assess if year of empanelment had any influence on the dependent variables.

RESULTS

CARE-SEEKING RATES WERE 67.4% (95% CI: 65.3, 69.4) for LBP and 75.8% (95% CI: 71.9, 79.7) for NP. Among the 3 major provider types, more than half saw only a physician across all conditions, while 27% to 29% sought chiropractic care and 11% to 14% physical therapy care (**TABLE 2**).

In the analysis between the MD/PT and the MD groups, bivariable differences were found in the variables of sex, ethnicity, level of educational attainment, income, insurance coverage, self-health rating, and condition (**TABLE 3**). When these variables were entered into the

multivariable model, only sex, education, and income were significant predictors of MD/PT over MD care (TABLE 4). Controlling for all other factors, the odds of seeking care from a physical therapist for females as compared to males was 65% higher (odds ratio [OR], 1.65; 95% CI: 1.19, 2.29). The odds of seeking care from a physical therapist for persons with higher income were twice those of persons in the low-income category (OR, 2.09; 95% CI: 1.29, 3.40). The odds for those with a high school degree (OR, 2.1; 95% CI: 1.14, 3.88) or college degree (OR, 2.01; 95% CI: 0.10, 4.02) were twice those with no degree. Based on the constructs of the conceptual model, only variables incorporated in the predisposing and enabling factors were significant predictors.

In the analysis between the MD/PT and DC groups, bivariable differences were found in the variables of age, sex, metropolitan statistical area, income, self-health rating, and disability day (TABLE 3). When these variables were entered into the multivariable model, age, sex, self-health rating, and disability day were all significant predictors of seeking physical therapy care over chiropractic care (TABLE 4). The odds of females seeing physical therapists, as compared to chiropractors, were approximately twice those of males (OR, 2.02; 95% CI: 1.38, 2.95). Those who saw physical therapists were more likely to have a lower self-health rating (OR, 1.93; 95% CI: 1.09, 3.40) and were over 3 times more likely to have at least 1 disability day (OR, 3.80; 95% CI: 2.50, 5.76). Whether the person sought care for NP or LBP was not significant in any of the models that allowed for the combining of persons with both NP and LBP. The variables that were significant from the conceptual model were derived from the predisposing, enabling, and need factors.

DISCUSSION

CONSISTENT WITH PREVIOUS STUDIES on only LBP,^{7,21,28} we found that physicians in isolation saw the greatest

TABLE 3		PARTICIPANT CHARACTERISTICS BY FACTORS FROM THE CONCEPTUAL MODEL*		
	MD (n = 1497)	DC (n = 622)	MD/PT (n = 233)	
Predisposing factors				
Age, y ⁱ	49.7 (48.6, 50.9)	45.6 (44.1, 47.0)	51.3 (48.5, 54.0)	
Sex ^t				
Male	42.5 (39.7, 45.3)	46.9 (42.7, 51.1)	32.3 (25.6, 39.0)	
Female	57.5 (54.7, 60.3)	53.1 (48.9, 57.3)	67.7 (61.0, 74.4)	
Race				
White	85.3 (83.0, 87.6)	91.1 (87.8, 94.3)	87.3 (82.6, 91.9)	
Nonwhite	14.7 (12.4, 17.0)	8.9 (5.7, 12.1)	12.7 (8.1, 17.4)	
Ethnicity ^g				
Hispanic	9.8 (8.2, 11.5)	4.5 (2.7, 6.3)	3.9 (1.6, 6.3)	
Not hispanic	90.2 (88.5, 91.8)	95.5 (93.7, 97.3)	96.1 (93.7, 98.4)	
Education ^h				
No degree	18.9 (16.6, 21.2)	10.2 (7.3, 13.0)	7.7 (4.3, 11.0)	
HS or GED	52.3 (49.0, 55.6)	58.1 (53.6, 62.6)	55.5 (47.7, 63.3)	
College or university	21.6 (19.0, 24.3)	23.0 (19.1, 26.8)	30.0 (23.4, 36.5)	
Other degree	7.2 (5.6, 8.8)	8.7 (6.1, 11.3)	6.9 (3.0, 10.8)	
Enabling factors				
MSA ^j				
Non-MSA	19.4 (16.9, 21.8)	26.6 (21.6, 31.5)	18.7 (12.6, 24.8)	
MSA	80.6 (78.2, 83.1)	73.4 (68.5, 78.4)	81.3 (75.2, 87.4)	
Census region				
Northeast	21.2 (17.1, 25.3)	19.1 (12.7, 25.6)	28.6 (17.8, 39.3)	
Midwest	23.7 (20.4, 27.1)	38.2 (31.0, 45.4)	25.7 (18.2, 33.3)	
South	34.8 (30.7, 38.9)	24.3 (17.3, 31.4)	30.2 (22.1, 38.3)	
West	20.2 (16.5, 24.0)	18.3 (12.8, 23.9)	15.4 (8.0, 22.8)	
Income ^g				
Low	28.7 (26.1, 31.2)	18.6 (15.2, 21.9)	16.0 (10.9, 21.1)	
Middle	31.9 (28.8, 35.1)	32.6 (28.2, 37.1)	26.6 (19.6, 33.7)	
High	39.4 (36.1, 42.7)	48.8 (44.4, 53.2)	57.4 (49.4, 65.3)	
Insurance coverage ^{**}				
Any private	73.5 (71.2, 75.8)	84.2 (81.0, 87.5)	82.7 (77.2, 88.2)	
Public only	19.0 (17.0, 21.1)	8.0 (5.4, 10.5)	13.2 (8.1, 18.2)	
Uninsured	7.5 (6.1, 8.9)	7.8 (5.4, 10.2)	4.1 (1.9, 6.3)	

Table continues on page 473.

proportion of patients with LBP and NP. The rank order of the 3 providers, in terms of the proportion of patients seen, was physicians, chiropractors, and physical therapists. This sequence is a direct match to previous care-seeking research.^{16,21,24} This rank order may be a reflection of clinical guidelines published for both consumers and providers.^{1,13} It may also reflect consumer preference, which would indicate that the most preferred or possibly trusted provider for both LBP and NP is a physician. Of

concern to physical therapists should be the low proportion of persons with clinically important spinal pain that received physical therapy. Though our research did not offer solutions to this low level, it points to a need to explore approaches to improving access to physical therapy among persons with LBP and NP, or, perhaps, to a need for improvements in understanding the benefits of seeking physical therapy care.

The analysis that compared MD/PT to MD users is, in actuality, an analy-

TABLE 3

PARTICIPANT CHARACTERISTICS BY FACTORS FROM THE CONCEPTUAL MODEL* (CONTINUED)

	MD (n = 1497)	DC (n = 622)	MD/PT (n = 233)
Need factors			
Self-health rating ^{††}			
Very good to excellent	38.8 (35.6, 42.0)	59.6 (54.8, 64.4)	43.8 (36.9, 50.8)
Good	33.7 (30.6, 36.8)	29.2 (24.9, 33.5)	38.1 (31.0, 45.2)
Fair to poor	27.5 (24.7, 30.4)	11.2 (8.1, 14.4)	18.1 (13.3, 22.8)
Condition ^{††}			
LBP	84.3 (82.1, 86.5)	82.1 (78.6, 85.6)	78.7 (72.9, 84.6)
NP	15.7 (13.4, 17.9)	17.9 (14.4, 21.4)	21.3 (15.4, 27.1)
Disability days, d ^{§§}			
No	59.4 (56.5, 62.3)	82.0 (78.4, 85.5)	59.9 (52.6, 67.3)
Yes	40.6 (37.7, 43.4)	18.0 (14.5, 21.6)	40.1 (32.7, 47.4)
Comorbidities			
0	17.9 (15.5, 20.3)	26.5 (22.8, 30.1)	19.7 (13.9, 25.5)
1	20.4 (17.9, 22.9)	20.0 (16.6, 23.5)	18.0 (12.3, 23.6)
2 or more	61.7 (58.7, 64.8)	53.5 (49.5, 57.4)	62.3 (54.8, 69.8)
Episodes			
1	73.6 (71.1, 76.2)	71.4 (67.7, 75.2)	73.6 (67.2, 79.9)
2 or more	26.4 (23.8, 28.9)	28.6 (24.8, 32.3)	26.4 (20.0, 32.8)

Abbreviations: DC, chiropractor; HS, high school; GED, General Educational Development; LBP, low back pain; MD, physician; MD/PT, physician-referred physical therapy; MSA, metropolitan statistical area; NP, neck pain.

*Values are mean (95% confidence interval) for continuous data and percent (95% confidence interval) for categorical data.

[†]PT and DC: $t = 3.71$, $P < .001$.

[‡]PT and MD: $\chi^2 = 206.65$, $P = .007$; PT and DC: $\chi^2 = 627.65$, $P = .007$.

[§]PT and MD: $\chi^2 = 205.04$, $P = .0018$.

^{||}PT and MD: $\chi^2 = 508.05$, $P = .0006$.

[¶]PT and DC: $\chi^2 = 238.54$, $P = .0428$.

^{**}PT and MD: $\chi^2 = 693.43$, $P < .001$.

^{***}PT and MD: $\chi^2 = 223.91$, $P = .0115$; PT and DC: $\chi^2 = 256.09$, $P = .0247$.

^{††}PT and MD: $\chi^2 = 221.07$, $P = .0247$; PT and DC: $\chi^2 = 764.46$, $P = .0006$.

^{‡‡}PT and MD: $\chi^2 = 108.84$, $P = .0506$.

^{§§}PT and DC: $\chi^2 = 1910.02$, $P < .001$.

sis of the pattern of physician referrals to physical therapy. There were only 30 cases in which the provider of care was solely a physical therapist, and these cases may represent censoring of the data set, as physician care could have preceded data gathering. This is a limitation of our study. In the US, very few physical therapy visits occur without referral from a physician,^{18,22} and this is born out in the MEPS data. Freburger et al²⁶ found that, while referral to physical therapy specifically from selected specialty spine centers was highly related to need characteristics, other factors, including level of education, being female, and being over 50 years of age,

were related. This is similar to our findings and implies that the patients being captured by the physical therapy market via the physician referral network tend to be female, more educated, and of higher income brackets. This raises the question of whether the process of referral limits access to physical therapy and creates a disparity in use entirely unrelated to clinical factors such as acuity, extent of functional limitation, or disability. LBP prevalence studies point to a higher prevalence of this condition among those of lower socioeconomic status,²⁰ which suggests that this subpopulation may have insufficient access to physical therapy service.

Comparison of the MD/PT and DC groups indicates that those who are seeing physical therapists are more likely to be female, to be older, to have lower self-rating of health status, and to have had at least 1 disability day associated with their spine problem. The chiropractic profession is experiencing a growth in the total number of adults using chiropractic of 57% from 2000 to 2003.¹⁹ The drivers of this increase have not been identified; however, in a competitive market that relies on a profession's reputation and advertising, there may be cause for the physical therapy profession to examine its target population in comparison to that of chiropractic.

The 2 primary analyses, in light of the conceptual model, showed that variables from the predisposing factors were significant. In both models, females were more likely to seek care from physical therapists. There is evidence that women use more health services, have higher rates of morbidity, and, most importantly, perceive health and disability differently than men do.⁶ Some of these perceptions or demands on the system seem to result in a predominance of women receiving physical therapy care for spinal pain. We postulate that this is likely a multifactorial issue that may be due, in part, to a perception among men that physical therapy is a less acceptable form of intervention. This perception may also be related to the profession's historically lower ratio of male practitioners, as compared to those of medicine and chiropractic.^{11,12} More research is clearly needed to explore this issue.

Income, an enabling factor in the conceptual model, was significant in both analyses: individuals who sought care from physical therapists had higher incomes. This may be related to the time needed to complete an episode of physical therapy, the costs of coverage for this care, and the ability of those with higher incomes to afford taking time from work or home to seek care.

Only the PT/MD and DC analysis had variables under the need factor that were

TABLE 4

MULTIVARIABLE LOGISTIC REGRESSION ANALYSIS PREDICTING MD/PT CARE AS COMPARED TO MD CARE FOR SPINAL PAIN*

	β	SE	P	OR (95% CI)
Predisposing factors				
Age, y	.01	0.01	.157	1.01 (0.10, 1.02)
Sex				
Male [†]				1.00
Female	.50	0.17	.003	1.65 (1.19, 2.29)
Ethnicity				
Hispanic [†]				1.00
Not Hispanic	.57	0.33	.086	1.77 (0.92, 3.40)
Education				
No degree [†]				1.00
HS or GED	.75	0.31	.016	2.11 (1.14, 3.88)
College or university	.70	0.35	.050	2.01 (0.10, 4.02)
Other degree	.44	0.41	.281	1.55 (0.70, 3.47)
Enabling factors				
MSA				
Non-MSA [†]				1.00
MSA	-.10	0.21	.641	0.91 (0.61, 1.36)
Income				
Low [†]				1.00
Middle	.25	0.25	.330	1.28 (0.78, 2.11)
High	.74	0.25	.003	2.09 (1.29, 3.40)
Insurance coverage				
Any private [†]				1.00
Public only	-.09	0.27	.768	0.92 (0.54, 1.58)
Uninsured	-.28	0.32	.375	0.75 (0.40, 1.41)
Need factors				
Self-health rating				
Very good to excellent [†]				1.00
Good	.13	0.20	.503	1.14 (0.77, 1.69)
Fair to poor	-.18	0.22	.394	0.83 (0.54, 1.27)
Condition				
LBP [†]				1.00
NP	.30	0.20	.130	1.35 (0.92, 1.97)
Disability duration, d				
No [†]				1.00
Yes	.18	0.20	.368	1.19 (0.81, 1.75)

Abbreviations: CI, confidence; GED, general educational development; HS, high school; LBP, low back pain; MD, physician; MD/PT, physician-referred physical therapy; MSA, metropolitan statistical area; NP, neck pain; OR, odds ratio; SE, standard error.

*Adjusted Wald test: $F_{15,222} = 4.12, P < .01$.

[†]Reference category.

to be seen for more acute spine problems and physical therapists for more chronic ones. We believe the profession may need to do more to alter this perception and to work with referral sources, such as physicians, to encourage faster and easier access to physical therapy.

Limitations

While the MEPS offers abundant information on respondents, caution must be used in interpreting these results. Our study was limited by its small sample size, particularly for persons with NP, which might have adversely influenced our estimates. We adjusted for NP versus LBP in the multivariate models and found no effect; but, ideally, a larger sample of persons with NP would have allowed for separate analyses of LBP as compared to NP. The MEPS also lacks detailed clinical-level information about participants, including data on factors that might influence care seeking, such as condition acuity, severity, and functional limitations attributable to the condition. It is also possible that the data represented inaccurate answers or misinterpretations of the questions asked by interviewers. AHRQ has attempted to mitigate this problem by asking many of the questions multiple times over the course of panel interviews to ensure greater data reliability.¹⁵

In spite of these limitations, this study presents a unique perspective on care consumption patterns and enables health planners and members of each of the 3 professions to reflect on the differing user groups for the care offered. Future research on care seeking and care consumption should examine changes in consumption over longer time intervals and potential factors that may influence changes in care seeking over time.

CONCLUSION

PHYSICAL THERAPISTS, AS COMPARED to physicians and chiropractors, see the smallest proportion of persons with spine conditions. A number of so-

significant. Ideally, need variables should determine whether care is provided. While there was no measure of acuity in the MEPS data, having disability days and poorer health status associated with

the spine condition predisposed individuals to see a physical therapist. If disability days are associated with more chronic conditions, it is possible that there is a public perception that chiropractors are

TABLE 5

MULTIVARIABLE LOGISTIC REGRESSION ANALYSIS
PREDICTING MD/PT CARE AS COMPARED
TO DC CARE FOR SPINAL PAIN*

	β	SE	P	OR (95% CI)
Predisposing factors				
Age, y	.02	0.01	.002	1.02 (1.01, 1.03)
Sex				
Male [†]				1.00
Female	.70	0.19	<.01	2.02 (1.38, 2.95)
Ethnicity				
Hispanic [†]				1.00
Not Hispanic	.08	0.37	.822	1.09 (0.52, 2.27)
Education				
No degree [†]				1.00
HS or GED	.15	0.39	.702	1.16 (0.54, 2.51)
College or university	.38	0.45	.402	1.46 (0.60, 3.56)
Other degree	-.14	0.53	.786	0.87 (0.31, 2.44)
Enabling factors				
MSA				
Non-MSA [†]				1.00
MSA	.37	0.25	.136	1.44 (0.89, 2.34)
Income				
Low [†]				1.00
Middle	.16	0.33	.621	1.18 (0.61, 2.27)
High	.55	0.32	.091	1.73 (0.92, 3.28)
Insurance coverage				
Any private [†]				1.00
Public only	.44	0.33	.189	1.55 (0.80, 3.00)
Uninsured	-.459	0.369	.218	0.632 (0.306, 1.31)
Need Factors				
Self-health rating				
Very good to excellent [†]				1.00
Good	.46	0.22	.038	1.58 (1.03, 2.45)
Fair to poor	.66	0.29	.023	1.93 (1.09, 3.40)
Condition				
LBP [†]				1.00
NP	.43	0.24	.075	1.54 (0.96, 2.46)
Disability days, d				
No [†]				1.00
Yes	1.33	0.21	<.01	3.80 (2.50, 5.76)

Abbreviations: CI, confidence interval; DC, chiropractor; GED, general educational development; HS, high school; LBP, low back pain; MD/PT, physician-referred physical therapy; MSA, metropolitan statistical area; NP, neck pain; OR, odds ratio; SE, standard error.

*Adjusted Wald test: $F_{15,222} = 4.12, P < .01$.

[†]Reference category.

ciodemographic factors are predictors of who gets care from physical therapists. These factors may provide evidence of an access disparity for physical therapy and also provide information about populations

that should be targeted for spinal care. ●

KEY POINTS

FINDINGS: Among patients with LBP and NP, the rate of physical therapy use is

lower than use of other professionals and is associated with sociodemographic variables.

IMPLICATION: Patients who might benefit from physical therapy are not receiving these services.

CAUTION: Although the study was based on a nationally representative sample, some important clinical constructs were not measured that may relate to use and access. In addition, no conclusions may be made about why some persons with LBP or NP do not receive physical therapy.

REFERENCES

1. Agency for Health Care Policy and Research. Acute Low Back Problems Guideline Panel. Acute low back problems in adults: assessment and treatment. *Am Fam Physician*. 1995;51:469-484.
2. Agency for Healthcare Research and Quality. Medical Expenditure Panel Survey: Home. Available at: <http://www.meps.ahrq.gov/mepsweb/>. Accessed February 26, 2010.
3. Agency for Healthcare Research and Quality. Medical Expenditure Panel Survey: Survey Questionnaires. Available at: http://www.meps.ahrq.gov/mepsweb/survey_comp/survey_questionnaires.jsp. Accessed February 26, 2010.
4. American Physical Therapy Association. APTA Vision 2020. Available at: www.apta.org/vision2020/. Accessed February 26, 2010.
5. Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? *J Health Soc Behav*. 1995;36:1-10.
6. Bertakis KD, Azari R, Helms LJ, Callahan EJ, Robbins JA. Gender differences in the utilization of health care services. *J Fam Pract*. 2000;49:147-152.
7. Carey TS, Evans A, Hadler N, Kalsbeek W, McLaughlin C, Fryer J. Care-seeking among individuals with chronic low back pain. *Spine (Phila Pa 1976)*. 1995;20:312-317.
8. Carey TS, Evans AT, Hadler NM, et al. Acute severe low back pain. A population-based study of prevalence and care-seeking. *Spine (Phila Pa 1976)*. 1996;21:339-344.
9. Carter SK, Rizzo JA. Use of outpatient physical therapy services by people with musculoskeletal conditions. *Phys Ther*. 2007;87:497-512. <http://dx.doi.org/10.2522/ptj.20050218>
10. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A comparison of physical therapy, chiropractic manipulation, and provision of an educational booklet for the treatment of patients with low back pain. *N Engl J Med*. 1998;339:1021-1029. <http://dx.doi.org/10.1056/>

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11. Cherkin DC, Deyo RA, Sherman KJ, et al. Characteristics of licensed acupuncturists, chiropractors, massage therapists, and naturopathic physicians. *J Am Board Fam Pract*. 2002;15:378-390.
12. Chevan J, Chevan A. A statistical profile of physical therapists, 1980 and 1990. *Phys Ther*. 1998;78:301-312.
13. Chou R, Qaseem A, Snow V, et al. Diagnosis and treatment of low back pain: a joint clinical practice guideline from the American College of Physicians and the American Pain Society. *Ann Intern Med*. 2007;147:478-491.
14. Cohen JW, Cohen SB, Bantnin JS. The medical expenditure panel survey: a national information resource to support healthcare cost research and inform policy and practice. *Med Care*. 2009;47:S44-50. <http://dx.doi.org/10.1097/MLR.0b013e3181a23e3a>
15. Cohen SB. Design strategies and innovations in the medical expenditure panel survey. *Med Care*. 2003;41:III5-III12. <http://dx.doi.org/10.1097/01.MLR.0000076048.11549.71>
16. Cote P, Cassidy JD, Carroll L. The treatment of neck and low back pain: who seeks care? Who goes where? *Med Care*. 2001;39:956-967.
17. Coulter ID, Hurwitz EL, Adams AH, Genovese BJ, Hays R, Shekelle P. Patients using chiropractors in North America: who are they, and why are they in chiropractic care? *Spine*. 2002;27:291-297.
18. Crout KL, Tweedie JH, Miller DJ. Physical therapists' opinions and practices regarding direct access. *Phys Ther*. 1998;78:52-61.
19. Davis MA, Sirovich BE, Weeks WB. Utilization and expenditures on chiropractic care in the United States from 1997 to 2006. *Health Serv Res*. 45:748-761. <http://dx.doi.org/10.1111/j.1475-6773.2009.01067.x>
20. Deyo RA, Mirza SK, Martin BI. Back pain prevalence and visit rates: estimates from U.S. national surveys, 2002. *Spine (Phila Pa 1976)*. 2006;31:2724-2727. <http://dx.doi.org/10.1097/01.brs.0000244618.06877.cd>
21. Deyo RA, Tsui-Wu YJ. Descriptive epidemiology of low-back pain and its related medical care in the United States. *Spine (Phila Pa 1976)*. 1987;12:264-268.
22. Domholdt E, Durchholz AG. Direct access use by experienced therapists in states with direct access. *Phys Ther*. 1992;72:569-574.
23. Ferreira ML, Machado G, Latimer J, Maher C, Ferreira PH, Smeets RJ. Factors defining care-seeking in low back pain—a meta-analysis of population based surveys. *Eur J Pain*. 2009;14:747e1-747e7. <http://dx.doi.org/10.1016/j.ejpain.2009.11.005>
24. Feuerstein M, Marcus SC, Huang GD. National trends in nonoperative care for nonspecific back pain. *Spine J*. 2004;4:56-63.
25. Freburger JK, Carey TS, Holmes GM. Management of back and neck pain: who seeks care from physical therapists? *Phys Ther*. 2005;85:872-886.
26. Freburger JK, Carey TS, Holmes GM. Physician referrals to physical therapists for the treatment of spine disorders. *Spine J*. 2005;5:530-541. <http://dx.doi.org/10.1016/j.spinee.2005.03.008>
27. Gamache G, Rosenheck RA, Tessler R. Factors predicting choice of provider among homeless veterans with mental illness. *Psychiatr Serv*. 2000;51:1024-1028.
28. Hart LG, Deyo RA, Cherkin DC. Physician office visits for low back pain. Frequency, clinical evaluation, and treatment patterns from a U.S. national survey. *Spine (Phila Pa 1976)*. 1995;20:11-19.
29. Hosmer D, Lemeshow S. *Applied Logistic Regression*. 2nd ed. New York, NY: Wiley-Interscience; 2000.
30. Hurwitz EL, Coulter ID, Adams AH, Genovese BJ, Shekelle PG. Use of chiropractic services from 1985 through 1991 in the United States and Canada. *Am J Public Health*. 1998;88:771-776.
31. Hurwitz EL, Morgenstern H. The effects of comorbidity and other factors on medical versus chiropractic care for back problems. *Spine (Phila Pa 1976)*. 1997;22:2254-2263; discussion 2263-2254.
32. Hurwitz EL, Morgenstern H, Harber P, et al. A randomized trial of medical care with and without physical therapy and chiropractic care with and without physical modalities for patients with low back pain: 6-month follow-up outcomes from the UCLA low back pain study. *Spine (Phila Pa 1976)*. 2002;27:2193-2204. <http://dx.doi.org/10.1097/01.BRS.0000029253.40547.84>
33. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. *Spine (Phila Pa 1976)*. 2006;31:611-621; discussion 622. <http://dx.doi.org/10.1097/01.brs.0000202559.41193.b2>
34. Jette AM, Davis KD. A comparison of hospital-based and private outpatient physical therapy practices. *Phys Ther*. 1991;71:366-375; discussion 376-381.
35. Jette AM, Smith K, Haley SM, Davis KD. Physical therapy episodes of care for patients with low back pain. *Phys Ther*. 1994;74:101-110; discussion 110-105.
36. Meade TW, Dyer S, Browne W, Townsend J, Frank AO. Low back pain of mechanical origin: randomised comparison of chiropractic and hospital outpatient treatment. *BMJ*. 1990;300:1431-1437.
37. Mielenz TJ, Carey TS, Dyrek DA, Harris BA, Garrett JM, Darter JD. Physical therapy utilization by patients with acute low back pain. *Phys Ther*. 1997;77:1040-1051.
38. Phillips KA, Morrison KR, Andersen R, Aday LA. Understanding the context of healthcare utilization: assessing environmental and provider-related variables in the behavioral model of utilization. *Health Serv Res*. 1998;33:571-596.
39. Sharma R, Haas M, Stano M. Patient attitudes, insurance, and other determinants of self-referral to medical and chiropractic physicians. *Am J Public Health*. 2003;93:2111-2117.
40. Shekelle PG, Brook RH. A community-based study of the use of chiropractic services. *Am J Public Health*. 1991;81:439-442.
41. Shekelle PG, Markovich M, Louie R. Factors associated with choosing a chiropractor for episodes of back pain care. *Med Care*. 1995;33:842-850.
42. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. *Spine (Phila Pa 1976)*. 1998;23:1875-1883; discussion 1884.
43. Skargren EI, Oberg BE, Carlsson PG, Gade M. Cost and effectiveness analysis of chiropractic and physiotherapy treatment for low back and neck pain. Six-month follow-up. *Spine (Phila Pa 1976)*. 1997;22:2167-2177.



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